DePuy Synthes
POWER TOOLS
COMPANIES OF Johnson & Johnson

PNEUMATIC SYSTEMS

High-speed performance and power
in a variety of applications

ANSPACH®

USER'S MANUAL

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Image intensifier control

ANSPACH PNEUMATIC SYSTEMS

High speed performance and power in a variety of applications

DePuy Synthes Power Tools

DePuy Synthes Power Tools manufactures pneumatic and electric high performance instruments and attachments to meet the specific needs of both surgeon and staff. While the advanced design of these instruments provides unparalleled performance and reliability, they also allow for effortless assembly for the most demanding applications. No tools are required to assemble dissection tools or attachments.

All *DePuy Synthes Power Tools* instruments are manufactured to conform to rigorous quality standards to provide dependable performance.

Warning: Before using any of the Anspach High Speed Pneumatic Systems, it is imperative that all individuals working with the system read this operating manual. The surgeon is responsible for learning the proper techniques in the use of this system, as improper use may cause injury.

To schedule a hands-on training course, either at *DePuy Synthes Power Tools* or from your local *DePuy Synthes Power Tools* Sales Representative, call (800) 327-6887 or (561) 627-1080.

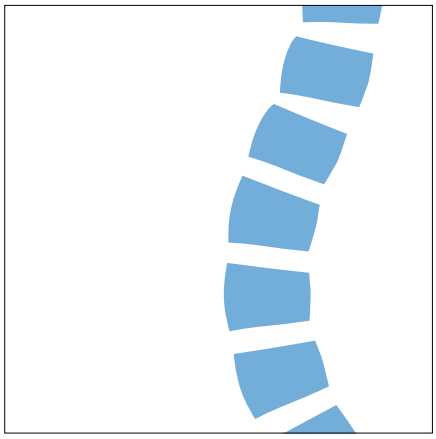
If you have any questions after reading this manual, please call the *DePuy Synthes Power Tools* Customer Service Department at (800) 327-6887 or (561) 627-1080.

High-Speed Pneumatic Systems

The XMax® System sets a new standard for the ultimate combination of high power, smooth operation, low noise level, and small size. This new level of performance provides the perfect pneumatic system to handle a complete range of surgical procedures ranging from power demanding applications to the most delicate dissection. With a minimum speed of 80,000 rpm at 120 psi (8.3 bar) input pressure, the XMax system is one of the quietest pneumatic handpieces available, with 35% more power than Black Max and 50% more than microMax Plus.

The Black Max, operating at 80,000 rpm at 120 psi (8.3 bar), offers smooth, controlled bone dissection.

The iMRI Instrument System provides an Intraoperative MRI compatible configuration. The iMRI Instrument System utilizes non-magnetic materials in the handpiece, attachment, and dissection tool components that have been approved for use with field strengths up to 1.5 Tesla.



Spine surgery

Neurosurgery, otology and neurotology

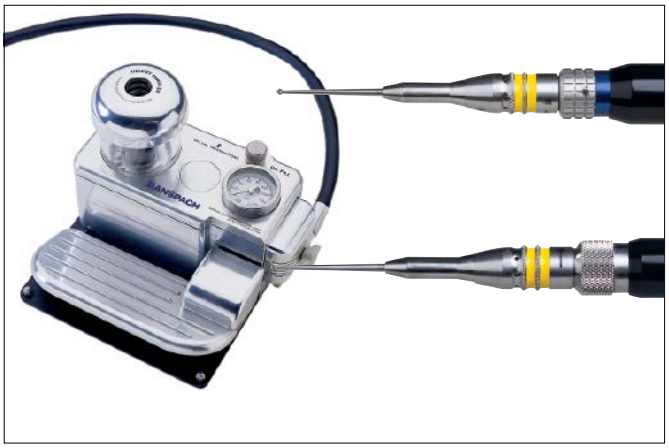
INDICATIONS

XMax
Cutting and shaping bone

Black Max
Cutting and shaping bone

iMRI Surgical Drill System
The Anspach iMRI Surgical Drill System (including pneumatic drill motor, foot control, nosepiece attachments, and cutters), is indicated for intraoperative (non-imaging) use within a Magnetic Resonance Imaging (MRI) environment rated at 1.5 Tesla or less, for surgical cutting, shaping, and removal of bone, including bones of the skull and spine.

Black Max



XMax

iMRI

WARNINGS AND CAUTIONS

Warnings

⚠ **Irrigation is necessary for proper operation**

Surgeon is responsible for learning proper techniques in use of equipment; improper use may cause serious injury to user or patient or damage to system.

Instrument operator and all operating room personnel must wear eye protection.

Visually inspect for damage before using; do not use if damage is evident.

Do not use if the product sterilization barrier or its packaging is compromised.

Do not use, or discontinue use of powered equipment exhibiting excessive temperatures that can cause patient injury (necrosis) and/or user discomfort.

Use of damaged or improperly maintained power equipment and/or misused powered equipment can result in excessive temperatures.

Use caution to avoid cutting or tearing gloves while handling dissection tools.

Dissection tools must be adequately retained within attachment to prevent distal migration, which may cause injury.

Confirm attachment is proper size for dissection tool and that it is secure.

Gently pull on dissection tool shaft to ensure it is fully seated and properly installed.

Only cut visible areas unless an image intensifier is utilized.

Delicate structures in proximity to dissection must be thoroughly protected to prevent injury.

Maintain firm control of instrument at all times.

Do not bend or use as a lever.

Use a gentle tapping motion or side-to-side motion and let instrument do cutting.

Do not use excessive force.

Forceful side loading of dissection tool may cause fracture of dissection tool, which may cause injury.

Dissection tools are disposable and intended for single patient use only. Do not resterilize and/or reuse dissection tools.

Use standard protocol for disposal of sharp instruments.

Continuous extreme cutting at or near stalling conditions will quickly overheat handpiece.

Do not operate in an explosive flammable environment.

Do not modify ground or power cord.

Do not allow liquid into console.

Do not use in oxygen rich environment.

Dispose of items contaminated with body fluids or other biohazardous waste.

At end of life, recycle or dispose of device in accordance with local and national regulations. Irrigation Tubes contain DEHP a type of phthalate.

Cautions

United States Federal law restricts this device to sale by or on order of a physician or other licensed healthcare provider.

Do not use accessories other than those provided by *DePuy Synthes Power Tools* and specified for use with *DePuy Synthes Power Tools* systems.

Use care to protect hose when handling, cleaning, and during system use.

Damage to hose can cause leaking, rupture, or other related failures.

Do not step on, set equipment on, pinch, kink, clamp, or otherwise occlude handpiece hose during use.

To ensure equipment operates as designed, read and follow manufacturer's instructions.

Do not operate handpiece without an attachment and the corresponding dissection tool.

Do not engage safety mechanism while handpiece is running; doing so makes safety mechanism inoperable.

TECHNICAL SPECIFICATIONS

BM

Black Max Specifications*

Speed	up to 80,000 rpm
Handpiece, muffler, hose	3.81 m (12.50 ft)
Outside housing (diameter)	19.05 mm (0.75 in)
Length of housing	91.44 mm (3.60 in)
Handpiece weight	70.0 g (2.6 oz)
Handpiece, muffler, hose weight	0.65 kg (1.40 lbs)

XM

XMax Specifications

Speed	up to 80,000 rpm
Handpiece, muffler, hose	3.81 m (12.50 ft)
Outside housing (diameter)	17.53 mm (0.69 in)
Length of housing	102.36 mm (4.03 in)
Handpiece weight	75.30 g (2.7 oz)
Handpiece, muffler, hose weight	0.65 kg (1.45 lbs)

This device complies with applicable EEC directives.

CE 0086

iMRI

iMRI Handpiece

Speed	10,000-75,000 rpm
Handpiece and Hose	3.81 m (12.50 ft)
Outside Housing (diameter)	17.53 mm (0.69 in)
Length of Housing	101.60 mm (4.00 in)
Handpiece and hose weight	635.00 g (1.41 lb)

Patent Information

DePuy Synthes Power Tools products are manufactured under one or more of the following U.S. Patent Nos.

RE 37,358; 5,405,348; 5,601,560; 5,630,818; 5,741,084; 5,904,687; 6,607,533; 6,733,218; 6,746,153; 6,749,341; 6,969,368; 7,128,544; 7,144,415; 7,217,090; 7,255,546; 7,261,526 and 7,458,979.

Additional U.S. and International patents pending.

Additional Information

All specifications are subject to change.

* The *DePuy Synthes Power Tools* Black Max Instrument System is not sponsored by, endorsed by or otherwise associated with United States Manufacturing Corp. or its Blackmax prosthetic limbs.

GLOSSARY OF SYMBOLS

30 Sec ON/ 30 Sec OFF	Duty Cycle of the DRIVER
	Company Logo
	Direction of rotation
	Direction of rotation for lock position
	Indicates setting, position, or location
	Indicates setting, position, or location
3MM 4MM 5MM 6MM	Indicates the drill tip exposure
CUTTER RUN ADJUST TUBE	Indicates the attachment setting, refer to MA-D20 and MA-DRIVER section in this document for further details
	Indicates position or location
	Indicates position or location
SECURE RELEASE	Indicates action of rotation and position for Secure (LOCK) and Release (UNLOCK)
	Direction of rotation
	Direction of rotation for lock position
	Direction of rotation
RUN SAFE LOAD	Located on the Handpiece this indicates position of the knurl knob to the desired location
	Symbol with yellow background: CAUTION: Refer to accompanying documentation

	Consult Operating Instructions
	Temperature Limits
REF	Reference Number (A.K.A. Item Number, Catalog Number, Part Number)
LOT	Lot (A.K.A. Lot Number, Batch Number, Batch Code)
SN	Serial Number
	Single Use Only (A.K.A. Do Not Reuse)
	Manufacturer
EC REP	Authorized European Union Representative
STERILE R	Sterilized Using Irradiation
00/0000	Use By Date (A.K.A. Do Not Reuse)
	CAUTION: Refer to accompanying documentation
	Keep Dry (A.K.A. Protect from Moisture)
	Sterile unless damaged or open
Rx ONLY	United States Federal law restricts this device to sale by or on the order of a physician or other licensed health-care provider
CE 0086	CE Mark (A.K.A. CE Mark [notified body number], Conformité Européenne) Meaning: Device complies with applicable EEC Directives

	Certified/Accredited Test House
	Lock (Run)
	Unlock (Load)
	Product warranty is void if seal is damaged or removed.
	Humidity Limits

Instrument System Key

BM Black Max **XM** XMax

iMRI iMRI

Latex-free Certification

Products not made with natural rubber latex.

AUTOLUBE III OPERATING INSTRUCTIONS (FOR BLACK MAX AND XMAX)

ASSEMBLY PROCEDURES OF AUTOLUBE III AND HANDPIECE

AUTOLUBE III Foot Control
For additional part numbers, refer to the "Ordering Information" section.

1. Remove the red plug (installed for shipping only) from the recirculating bowl located on the top of the AutoLube III.
2. Turn the silver handle located on the back of the AutoLube III to the "OPEN" position.
3. While maintaining the handle in the "OPEN" position, insert the muffler end of the pneumatic handpiece into the cavity located on top of the recirculating bowl.
4. Insert the muffler until the red ring on the muffler cannot be seen.
5. Rotate silver handle to the "LOCK" position. Check for secure engagement.

Operating Pressure

Anspach pneumatic handpieces run on air or medical grade nitrogen. Standard operating pressure is 90–120 psi (6.2–8.3 bar). If more or less power is desired, the psi may be regulated between 40 and 140 psi (2.8 and 9.6 bar).

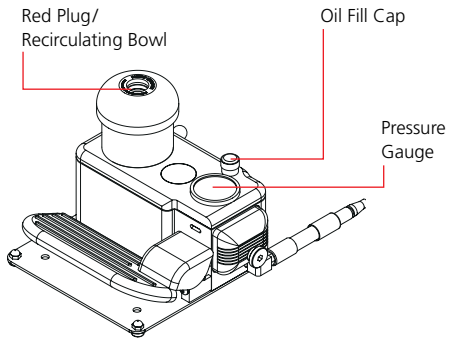
1. Connect the air hose from the AutoLube III to the hospital air source, nitrogen tank or hospital nitrogen system.
2. Adjust the air source until the desired air pressure registers on the gauge of the AutoLube III. Pressure will not register on the AutoLube III until the muffler is inserted and the foot pedal is activated.
3. The wall/nitrogen tank pressure may read as much as 40 psi higher than the AutoLube III gauge.

Note: Handpiece is fully functional at this time.

Special Operating Pressures for Attachments:
B-ORANGE-45 run at 40 psi (2.8 bar)
B-ORANGE-90 run at 40 psi (2.8 bar)

Special Operating Pressures for Dissection Tools:
SIL-DS-A run at 70 psi (4.8 bar)
SHD-DS-A run at 70 psi (4.8 bar)

1



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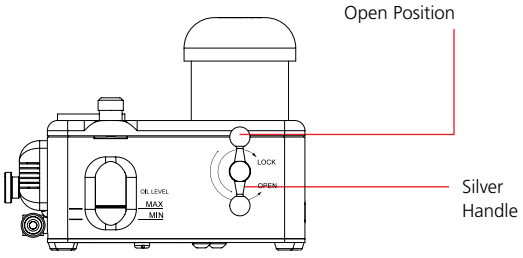

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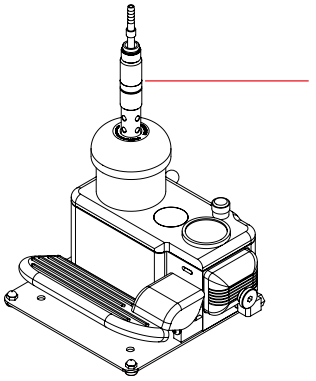

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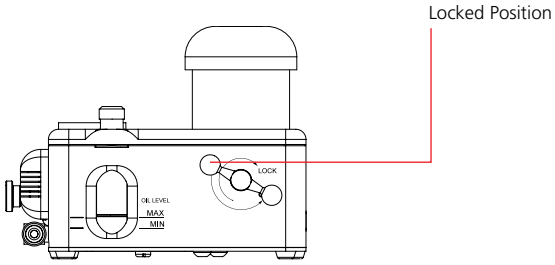
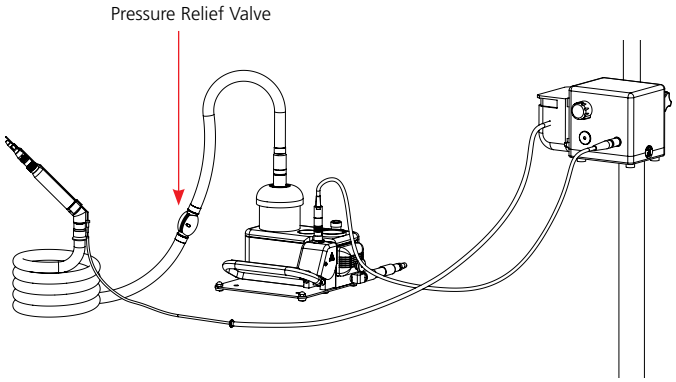


Pressure Relief Valve

Note: Handpiece hose may include a pressure relief valve to remove excess pressure in the case of hose occlusion between the AutoLube and the valve. If the pressure relief valve is actuated during use, remove the source of the occlusion. Do not attempt to disassemble the pressure relief valve.



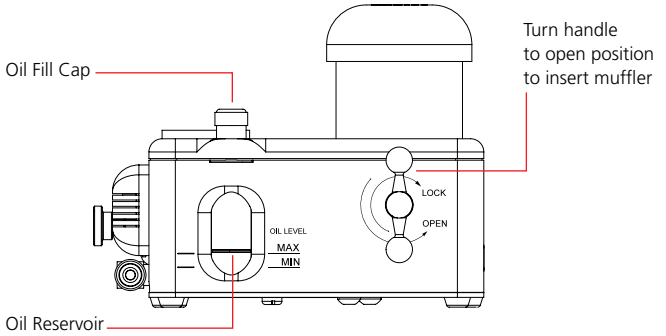
AutoLube Lubrication

OIL-II Instrument Oil with 1 Replacement Filter

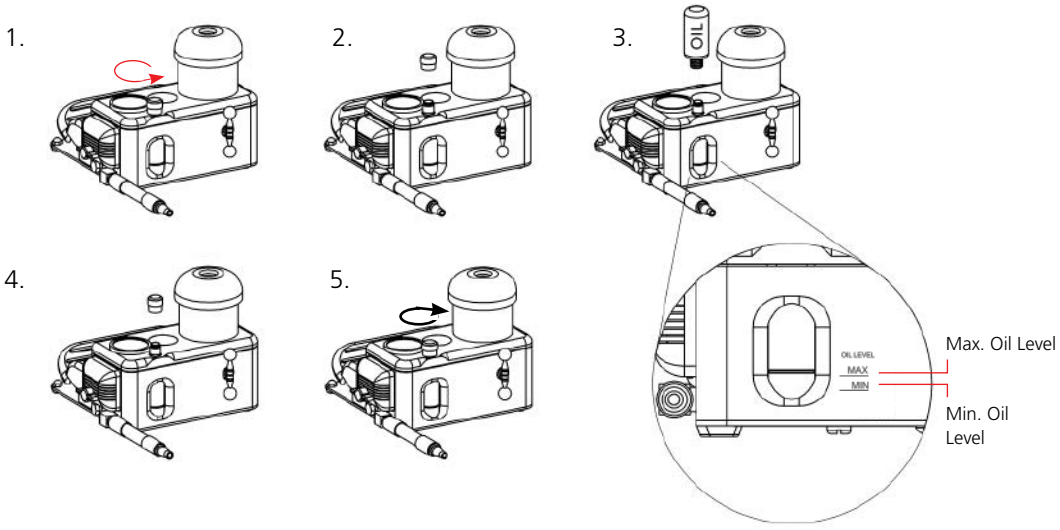
Note: The AutoLube III has been delivered without oil or a filter installed. A bottle of Anspach lubricating oil, filter, and muffler have been shipped with the unit and must be added to the AutoLube III prior to use.

1. Before adding oil, disconnect the AutoLube III from the air source.
2. Remove Oil Fill Cap from the top of the AutoLube III and fill with Anspach lubricating instrument oil (OIL-II).

Do not fill above the "MAX" oil level line next to the oil reservoir. Always replace the oil fill cap securely. One full bottle of Anspach lubricating oil should be added when the oil level reaches the "MIN" oil level line etched next to the oil reservoir.



AutoLube III Lubrication



AutoLube Lubrication continued

3. Before each use, a visual check of the oil reservoir should be made to ensure there will be an adequate supply of oil to circulate throughout the procedure.
4. Install filter and muffler following "AutoLube III Filter" section.

Note: Always store and transport AutoLube III in an upright position.

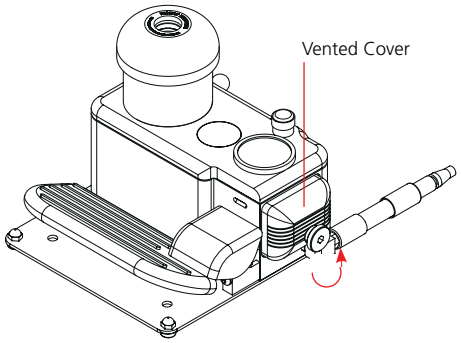
AutoLube III Filter

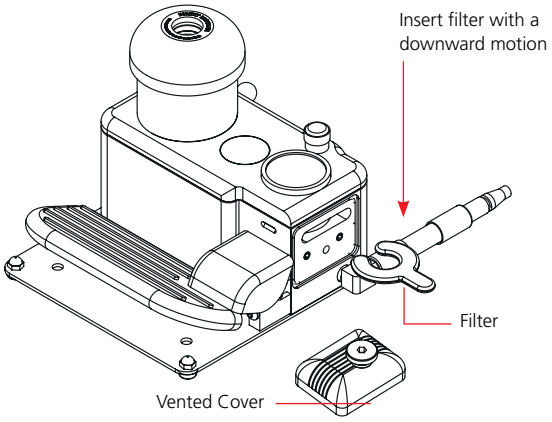
FILTER-II AutoLube II and III Filters (5/pkg.)

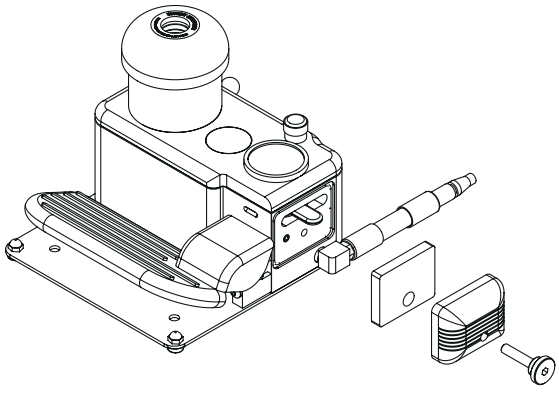
The filter, muffler filter, and vented cover have been packed separately in the AutoLube III box. The filters should be changed each time a bottle of Anspach lubricating oil is added.

1. Insert the filter by taking the tab and sliding the "horseshoe" shaped portion of the filter into the cavity in a downward motion. The tab will extend out of the cavity.
2. Push muffler filter into vented cover with the hole in muffler filter centered over the attachment screw. The muffler is oversized and must be compressed to fit.
3. Place the vented cover over the filter cavity and secure by turning the grey wingnut in a clockwise direction.

AutoLube III Filter







Black Max Handpiece BM

BLACKMAX-N	Handpiece, Fixed/Straight
BLACKMAX-N-LP	Low Pressure Handpiece, Swivel Angle

Operation

Caution: Firm control of the Black Max must be maintained at all times. Never force the dissection tool. Let the instrument do the cutting. Never use the attachments as a retractor to bend or pry.

Only Anspach Black Max dissection tools should be used with the Black Max.

Warning: Always use continuous irrigation to prevent heat build-up.

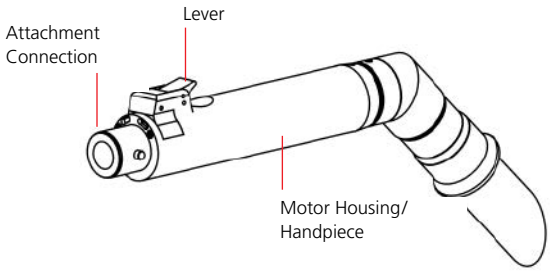
Always wear safety glasses.

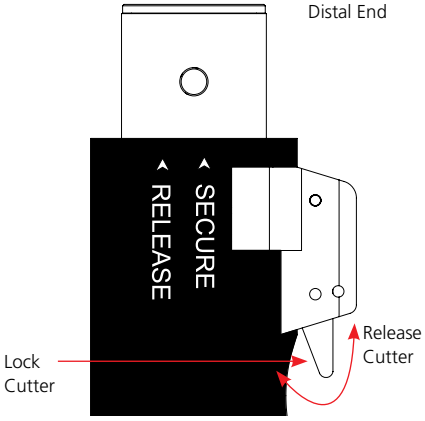
Black Max Directional Features

The words "SECURE" and "RELEASE" engraved on the side of the Black Max handpiece refer to the locking and unlocking the attachment onto the handpiece.

The Lever, located on the top of the handpiece, is used to lock and unlock dissection tools within the handpiece.

Caution: If the dissection tool is not inserted properly, the Lever will not secure the dissection tool. Do not force the Lever. For instructions on attachment assembly, refer to the specific instructions for each attachment in this manual.





The location of the lever determines the lock and release of the cutter.

The XMax Handpieces XM

XMax	XMax Handpiece
XMax-H	XMax Handpiece, High Strength Hose

Operation

Caution: Firm control of the handpiece must be maintained at all times. Never force the dissection tool. Let the instrument do the cutting. Never use the attachments as a retractor to bend or pry.

Only Anspach XMax dissection tools should be used with the XMax.

Warning: Always use continuous irrigation to prevent heat build-up.

Always wear safety glasses.

XM

XMax Directional Arrows

Notice the directional arrows and printing on the distal end of the handpiece housing: "RUN" (🔒), "LOAD" (🔓) and "SAFE." These terms refer to locking and unlocking the attachment and dissection tool onto the handpiece (Figure 1).

For instructions on attachment assembly, refer to the specific instructions for each attachment in this manual.

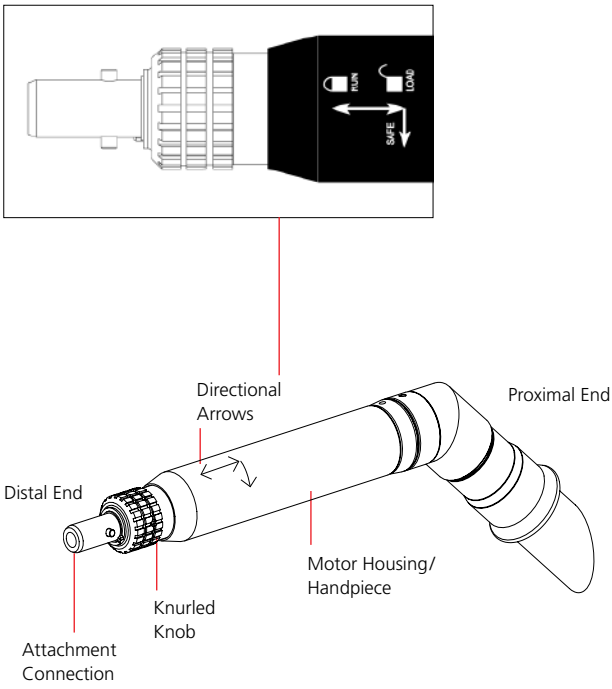


Figure 1

IMRI INSTRUMENT SYSTEM

iMRI Instrument System iMRI

IMRI-MOTOR	iMRI Motor
IMRI-FOOT-CTRL	iMRI Air Control
IMRI-SHORT	iMRI Short Attachment
IMRI-SHORT-HD	iMRI Short HD Attachment
IMRI-CRANI-A	iMRI Crani-A Attachment
IMRI-OIL	iMRI Synthetic Oil

For additional components, refer to page 40.

Use, Care, and Operating Instructions

Warning: Do not use any attachments or dissection tools with iMRI handpiece not manufactured by Anspach, or not identified as "iMRI." Do not operate handpiece without attachment and dissection tool installed.

Read and understand thoroughly before operating your new iMRI Instrument System. Failure to do so could lead to injury to you or your patient or cause severe damage to this equipment.

The iMRI Instrument System is a design modification of the Anspach microMax System. Refer to the "XMax Operating Instructions" section for additional assembly instructions.

iMRI System and dissection tools are constructed of materials that permit intraoperative use in an intraoperative magnetic resonance imaging unit rated at 1.5 Tesla or less and only when intraoperative magnetic resonance imaging is not being used for actual imaging purposes.

Caution: Do not use in intraoperative magnetic resonance imaging units rated at greater than 1.5 Tesla. Remove iMRI System from intraoperative magnetic resonance imaging volume during imaging. Failure to do so could result in unacceptable image noise and/or distortion.

Testing of iMRI System as established by ASTM F2213-02 "Standard Test Method for Measurement of Magnetically Induced Torque on Passive Implants in Magnetic Resonance Environment" and F2052-02 "Standard Test Method for Measurement of Magnetically Induced Displacement Force on Medical Devices in Magnetic Resonance Environment" confirm there is no detectable magnetically induced torque on handpiece at 1.5 Tesla (when tested in a 1.5T magnet) and only slight deflection force (10° with 18% of force due to gravity) when subjected to a high field strength and high field gradient location (1.5 Tesla) when tested in a Siemens 1.5T Magnetom Symphony, Maestro Class Unit.

iMRI System is designed for surgical procedures typically involving no more than 15 minutes of continuous (actively drilling) operation. If a procedure is expected to last longer, you should be aware handpiece speed and temperature may be affected.

Normal speed of iMRI System will be less than XMax due to magnetic effects and because iMRI System does not have continuous oiling. The lower speed will not adversely affect your ability to perform procedure and you will experience little to no magnetic pull on handpiece during use. However, the following effects may be noted:

1. Handpiece speed will slow when handpiece rotating mechanism is held 90° to magnetic field.
2. Handpiece temperature will increase when handpiece is held in 90° position for greater than 5 minutes. Handpiece should not become uncomfortably warm during normal use; procedures lasting greater than 15 minutes could cause handpiece temperature to rise.
3. Lock mechanisms of iMRI System and dissection tools are essentially the same as XMax. However, to help prevent unintended use of non-iMRI devices, geometry has been slightly modified to prohibit attachment of non-iMRI handpiece compatible devices.

iMRI Instrument System **iMRI** continued

Caution: Attempts to attach components other than iMRI System accessories to iMRI handpiece could result in significant damage to iMRI Handpiece.

Straight attachments should be used for no more than 10 procedures. Craniotome attachments should be used for no more than five procedures. Attachments are not repairable and should be replaced after the recommended number of uses.

Metal component parts of iMRI handpiece and attachments, and all iMRI dissection tools are constructed of materials mostly unaffected by magnetic properties of iMRI. However, these materials have significantly less hardness, which directly affects durability. Proper use, cleaning, maintenance, and preoperative inspection will help ensure safe use and prolong useful life of iMRI handpiece and attachments. Periodic routine servicing by Anspach is strongly recommended.

iMRI dissection tools will dull more quickly than standard dissection tools because they are manufactured of nonmagnetic reactive material. Use with iMRI only. During surgical use, you should remain cognizant of cutter performance and have additional dissection tools available at all times. Continued use of dull dissection tools, in addition to possible necroses, may put additional stress on attachment and handpiece, leading to premature failure of those devices. Before each use, assemble system and test to ensure proper performance.

Proper system performance is usually indicated when there is no unusual difficulty in attaching attachments and dissection tools, and when system operates at full speed (unloaded with dissection tools attached) with no unusual noise, vibration, wobble, or whipping.

Caution: Carefully inspect handpiece and attachments postcleaning and again preoperatively to ensure there is no corrosion or remaining debris which could adversely affect operation or lead to attachment bearing failure during use.

Continued use of damaged or worn handpiece or attachments can lead to bearing (or other) failures, which can result in foreign debris entering surgical wound site. Never reprocess or reuse iMRI dissection tools. iMRI dissection tools must be properly disposed of after a single use.

iMRI Operating Instructions

Caution: Do not run handpiece without dissection tool and attachment installed.

1. Foot control must be placed on floor within reach of surgeon. Foot control is not subject to sterilization so should never be placed such that sterile field is compromised.
2. Place three (3) drops of IMRI-OIL into muffler end of iMRI handpiece hose assembly. Do not exceed three (3) drops.

Caution: iMRI OIL is for use with iMRI handpiece only. Do not use with other Anspach "AutoLube" systems. iMRI OIL used in AutoLube can damage the sight window, resulting in oil leakage.

3. Connect muffler end of hose to foot control and inspect handpiece to ensure it is "iMRI" and that internal aspect of handpiece is free of damage or debris.

Caution: Do not run handpiece without dissection tool and attachment installed. Damage to handpiece may result if handpiece is operated without dissection tools and attachment installed.

4. Select appropriate attachment. Inspect for any signs of corrosion or damage and ensure it is "iMRI." Attach attachment to handpiece and turn clockwise to lock onto handpiece. Verify locking by pulling on attachment.
5. Select appropriate dissection tools and following all established sterile techniques, remove it from its packaging, insert it into and through attachment, into handpiece and lock into place. Verify locking by pulling on dissection tools. If using craniotome, dissection tool should be put into handpiece first, then put craniotome over dissection tools.
6. Attach iMRI foot control to air (or nitrogen) supply. Fully depress foot pedal and adjust supply air pressure such that gauge on foot control indicates 120 psi.
7. With handpiece in intraoperative magnetic resonance imaging field but away from patient, fully depress foot control and assess handpiece for noise, vibration, wobble, and whipping. If assembly was without difficulty and handpiece sounds and feels right, initiate or continue with use.
8. During procedure, continuously assess cutting effectiveness. Though iMRI dissection tools are designed to cut effectively, they are constructed of a much softer metal than standard (non-iMRI) Anspach dissection tools which you may be accustomed to. Because of material softness, iMRI dissection tools will dull more quickly. If you notice a reduction in cutting effectiveness, stop and replace dissection tools.

Warnings

- **Do not reprocess or use reprocessed dissection tools. iMRI dissection tools are constructed of stainless steel that is subject to dulling and possible distortion during initial use. Reprocessors may not be able to reprocess dissection tools to their original design condition and reuse could result in excessive whipping or vibration that could cause severe patient injury including death. Reprocessed dissection tools may also be duller than new dissection tools, resulting in less effective use and possible overheating causing necrosis of tissues and/or surgeon discomfort.**
- **Continued use of dull dissection tools can cause user to apply greater pressure while cutting, which can seriously damage attachment, and possible bearing failure. Bearing failure can result in foreign debris entering surgical wound site.**
- **iMRI craniotome is constructed of a softer metal than a non-iMRI craniotome and excessively applied force will cause craniotome leg/foot to bend or fracture. Do not bend attachment or use craniotome as a lever. Do not force dissection tools. Forceful side load may cause dissection tools fracture, which could cause injury. It can also result in handpiece speed reduction and increased temperature.**

9. During surgical procedure, when iMRI is used for actual imaging, remove iMRI System and dissection tools from imaging volume.

BLACK MAX STANDARD ATTACHMENTS AND DISSECTION TOOL ASSEMBLY

Black Max Dissection Tool Identification

All dissection tools are packaged sterile, unless otherwise indicated, and are manufactured for single use. Each dissection tool has a series of identification numbers and letters imprinted on the label and on the shaft. The first group of letters and numbers designate the part number, the second group of letters and numbers designate the lot number. Each attachment is laser-marked with its corresponding part number.

Black Max Straight Attachments

Refer to "Ordering Information" section for part numbers.

1. Lift Lever on handpiece. Align notch on attachment with "RELEASE" on side of Black Max handpiece. Turn attachment so notch is aligned with word "SECURE."
2. Insert dissection tool into attachment. Return Lever on Black Max handpiece to down position.
3. Pull dissection tool to ensure proper engagement.
4. Adjust air source until desired air pressure registers on AutoLube gauge.

Notes

- **Air pressure will not register until foot pedal is depressed.**
- **Handpiece is now fully functional.**

The operating pressure is 120 psi (8.3 bar), as indicated on the AutoLube gauge, when using these attachments, except for those specified in "AutoLube III Operating Instructions" section.

Black Max Contra and Right Angle Attachments

B-ORANGE-45 Contra Angle Attachment (Multiple Angle)
B-ORANGE-90 Right Angle Attachment (90°)

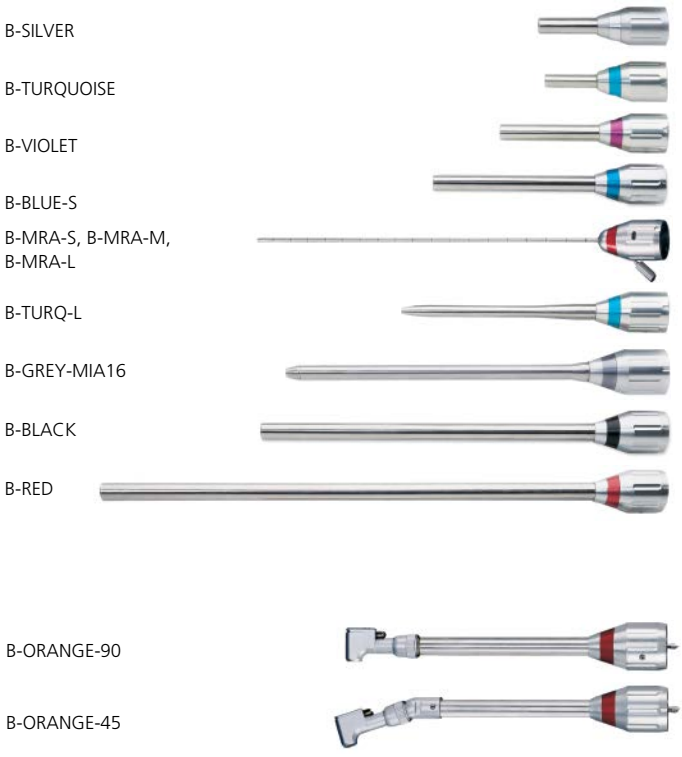
1. Lift Lever on handpiece. Align notch on attachment with "RELEASE" on side of Black Max handpiece. Turn attachment so notch is aligned with word "SECURE."
2. Push latch on the distal end of the attachment up with your thumb.
3. Insert dissection tool into the side of the distal end (opposite side of latch) while rotating slowly until dissection tool seats.
4. Release latch and check security of attachment by pulling it away from handpiece and check dissection tool by pulling on dissection tool head. Latch will be flush with attachment when dissection tool is secure.

Notes

- **The operating pressure for these attachments is 40 psi (2.8 bar).**
- **Handpiece is now fully functional.**

The first group of upper case letters of the dissection tool part number correspond to the attachment's color-coded ring and/or name and the last digit represents the dissection tool style.

For example:
Black Max Dissection Tool Part Number: SIL-8
Dissection Tool Description: #8 style dissection tool used with the B-SILVER attachment.



Black Max Craniotome and Specialty Attachments

Refer to "Ordering Information" section for part numbers.

1. Lift Lever on Black Max. Insert dissection tool into handpiece. Return Lever to down position. Pull dissection tool to ensure proper engagement.
2. Slide attachment over dissection tool. Align notch on attachment with word "RELEASE" on the Black Max. Next turn attachment so notch is aligned with word "SECURE."
3. The handpiece is now operational. Operating pressure is 120 psi (8.3 bar), as indicated on the AutoLube gauge, when using these attachments.

B-TURQ-X

B-GOLD

B-GREEN

B-GREEN-R

B-GREY-ADG

B-TURQ-CDA

Black Max QD Angle Attachments

Refer to "Ordering Information" section for part numbers.

1. Lift Lever on Black Max. Align notch on angle attachment with word "RELEASE" on the side of the Black Max. Next, turn angle attachment so notch is aligned with word "SECURE" which is laser etched on the side of the Black Max.
2. Pull down retaining sleeve on angle attachment and rotate to left when attachment is pointed away from you.
3. Insert dissection tool.
4. Release retaining sleeve by rotating to right.
5. Pull dissection tool to ensure proper engagement.
6. Return Lever on Black Max handpiece to down position.

Note: Handpiece is now fully functional.

Operating pressure is 120 psi (8.3 bar), as indicated on the AutoLube gauge, when using these attachments.

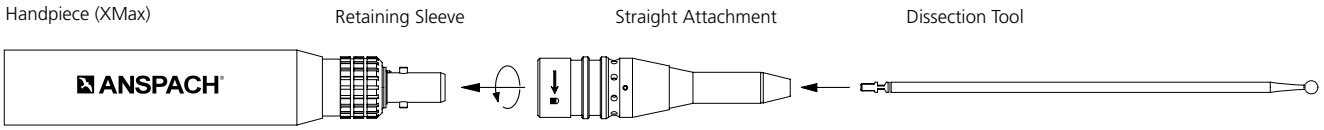
B-QD8

B-QD11

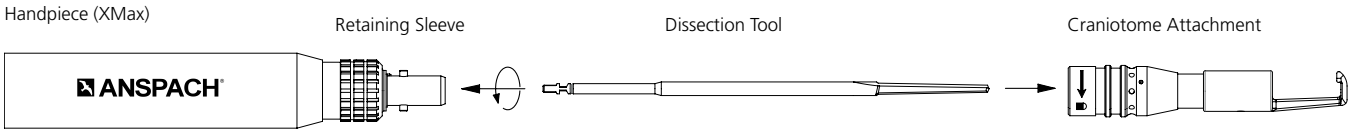
B-QD14

XMAX STANDARD ATTACHMENTS AND DISSECTION TOOL ASSEMBLY

Straight Attachment Assembly



Craniotome Attachment Assembly



Dissection Tool Identification

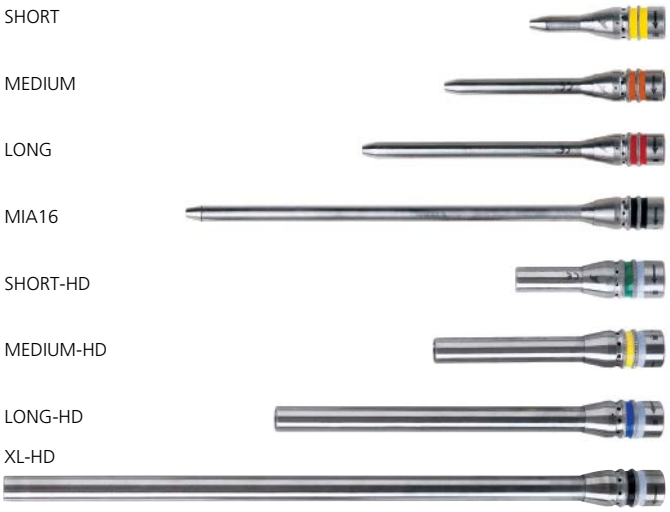
All dissection tools are packaged sterile, unless otherwise indicated, and are manufactured for single use. Each dissection tool has a series of identification numbers and letters imprinted on the label and on the shaft. The first letter describes the type of attachment, and the following characters indicate the size and style of the dissection tool.

For example:
Dissection Tool Part Number: S-2B
Dissection Tool Description: 2 mm Fluted Ball for Short attachment

Each attachment is laser-marked with its corresponding part number.

Straight Attachments

SHORT	5 cm Short Attachment
MEDIUM	8 cm Medium Attachment
LONG	11 cm Long Attachment
MIA16	16 cm Minimally Invasive Attachment
SHORT-HD	5 cm Heavy Duty Short Attachment
MEDIUM-HD	8 cm Heavy Duty Medium Attachment
LONG-HD	12.4 cm Heavy Duty Long Attachment
XL-HD	20.2 cm Heavy Duty Extra Long Attachment



XM

Assembly for handpieces with 🔒 and 🔓.

Distal end of handpiece or attachment is pointed away from user.

1. Move handpiece knurled knob to "RUN" (🔒) position.
2. Slide attachment over distal end of handpiece. Pull attachment towards handpiece, and rotate attachment to right approximately one quarter turn until fully seated. Handpiece knurled knob moves up to seat next to attachment.
3. Pull handpiece knurled knob towards "LOAD" (🔓) position and insert dissection tool into distal end of attachment. Rotate dissection tool slowly until fully seated.
4. Release handpiece knurled knob into "RUN" (🔒) position.

Note: Handpiece is now fully functional.

5. Pull dissection tool to ensure proper engagement.
6. Attachment and dissection tool are secure.

Disassembly

1. Move handpiece knurled knob to "SAFE" position.
2. Remove dissection tool from distal end of attachment.
3. Rotate attachment to left approximately one quarter turn, and remove from distal end of handpiece.

Orange 45° or 90° Contra and Right Angle Attachments

ORANGE-45 45° Contra Angle Attachment
ORANGE-90 90° Right Angle Attachment

Caution: Set AutoLube operating pressure to 40 psi (2.8 bar).

XM

Assembly for handpieces with 🔒 and 🔓.

1. Ensure knurled knob on handpiece is in "RUN" (🔒) position.
2. Slide attachment over distal end of handpiece. Push attachment towards handpiece, and rotate attachment counterclockwise until fully seated. Handpiece knurled knob moves up to seat next to attachment.
3. Push latch on the distal end of the attachment up with your thumb.
4. Insert dissection tool into the side of the distal end (opposite side of latch) while rotating slowly until dissection tool seats.
5. Release latch and check security of attachment by pulling it away from handpiece and check dissection tool by pulling on dissection tool head. Latch will be flush with attachment when dissection tool is secure.

Note: Handpiece is now fully functional.

Disassembly

1. Lift latch on the distal end of the attachment with your thumb. Remove dissection tool and release latch.
2. Move handpiece knurled knob to "SAFE" position.
3. Rotate attachment clockwise and remove from distal end of handpiece.

ORANGE-45

ORANGE-90

Craniotome and Specialty Attachments

CRANI-P	6.5 cm Pediatric Craniotome
CRANI-A	6.5 cm Adult Craniotome
CRANI-L	7.5 cm Large Craniotome
CRANI-A-R	6.5 cm Rotating Adult Craniotome
ADG	7.2 cm Adjustable Drill Guide
CDA	6.8 cm Controlled Depth Attachment

XM

Assembly for handpieces with 🔒 and 🔓.

Distal end of handpiece or attachment is pointed away from user.

1. Pull handpiece knurled knob towards "LOAD" (🔓) position and insert dissection tool into distal end of handpiece. Rotate dissection tool slowly until dissection tool is fully seated.
2. Release handpiece knurled knob into "RUN" (🔒) position.

Note: Handpiece is now fully functional.

3. Pull dissection tool to ensure proper engagement.
4. Slide attachment over distal end of handpiece. Pull attachment towards handpiece, and rotate attachment to right approximately one quarter turn until fully seated. Handpiece knurled knob moves up to seat next to attachment.
5. Attachment and dissection tool are secure.

Disassembly

1. Move handpiece knurled knob to "SAFE" position.
2. Rotate attachment to left approximately one quarter turn, and remove from distal end of handpiece.
3. Remove dissection tool from distal end of attachment.

QD Angle Attachments

QD8	8 cm Quick Disconnect Angle Attachment
QD11	11 cm Quick Disconnect Angle Attachment
QD14	14 cm Quick Disconnect Angle Attachment

XM

Assembly for Handpieces with 🔒 and 🔓.

Distal end of handpiece or attachment is pointed away from user.

1. Move handpiece knurled knob to "RUN" (🔒) position.
2. Slide attachment over distal end of handpiece. Pull attachment towards handpiece, and rotate attachment to right approximately one quarter turn until fully seated. Handpiece knurled knob moves up to seat next to attachment.
3. Pull retaining sleeve on angle attachment towards handpiece and rotate to left to the "RELEASE" position.
4. Insert dissection tool into angle attachment. Rotate dissection tool slowly until it is fully seated. Release retaining sleeve on angle attachment by rotating retaining sleeve to right to the "SECURE" position.

Note: Handpiece is now fully functional.

5. Pull dissection tool to ensure proper engagement.
6. Attachment and dissection tool are secure.

Disassembly

1. Pull retaining sleeve on angle attachment towards handpiece and rotate to left.
2. Remove dissection tool from distal end of attachment.
3. Move handpiece knurled knob to "SAFE" position.
4. Rotate attachment to left approximately one quarter turn, and remove from distal end of handpiece.

MINIMAL ACCESS ATTACHMENTS AND DISSECTION TOOL ASSEMBLY

Note: Instructions are the same for straight or angled drivers and for straight or curved bearing sleeves in 10 cm, 15 cm, and 19 cm lengths. The four words labeled on the drivers mean the following:

CUTTER	**Insert or remove dissection tool**
RUN	**Attachment and dissection tool are now functional**
ADJUST	**Bearing Sleeve can be moved 3 mm forward or back**
TUBE	**Insert or remove bearing sleeve**

Warning: The Minimal Access Attachments are to be used only for delicate bone dissection applications. Excessive force or side loads during use can cause rapid temperature increase at the distal end of the attachment. Always use copious irrigation with this attachment.

MA-D20BM	20° Angle Driver (for Black Max)
MA-D20	20° Angle Driver (for XMax)
MA-DRIVER	Straight Driver (for XMax)

MA-D20

MA-DRIVER

BM

Black Max 20° Angle Driver Installation

1. Ensure locking lever is up.
2. Align notch on BM 20° angle driver with "RELEASE" arrow on handpiece while inserting driveshaft of BM 20° angle driver into handpiece. Rotate BM 20° angle driver to right until notch is aligned with "SECURE" arrow on handpiece. Push locking lever down to locked position.
3. Gently twist back and forth to ensure driver is locked into position.

XM

XMax Driver Installation

1. Ensure handpiece is in "RUN" (🔒)
2. Insert driveshaft of driver into distal end of handpiece, push and rotate to right until it stops. Listen for a click as handpiece knurled knob moves up to seat next to driver.
3. Gently twist back and forth to ensure driver is locked into position.

Bearing Sleeve and Dissection Tool Assembly (BM 20° Angle Driver, 20° Angle Driver, or Straight Driver)

MA-10S	Bearing Sleeve, 10 cm Straight
MA-10C	Bearing Sleeve, 10 cm Curved
MA-15S	Bearing Sleeve, 15 cm Straight
MA-15C	Bearing Sleeve, 15 cm Curved
MA-15ST	Bearing Sleeve, 15 cm Straight Taper
MA-19ST	Bearing Sleeve, 19 cm Straight Taper

1. Rotate knurled knob on driver to line up arrow with "TUBE."
2. Fully insert desired bearing sleeve into distal end of driver by lining up black line on bearing sleeve with black line on driver.
3. Rotate knurled knob to line up arrow with "CUTTER." Check security of bearing sleeve by pulling distally.
4. Insert dissection tool into distal tip of bearing sleeve. Rotate dissection tool slowly until it is fully seated. Rotate knurled knob on driver to line arrow with "RUN."

Note: Additional force is required to seat dissection tool into curved bearing sleeve.

5. Check security of dissection tool by pulling distally on dissection tool head.
6. Bearing sleeve and dissection tool are secure.

Dissection Tool Disassembly

1. Rotate knurled knob on driver to line up arrow with "CUTTER." Remove dissection tool from distal end of attachment.

Bearing Sleeve Adjustment

1. Rotate knurled knob on driver to line up arrow with "ADJUST."
2. Pull bearing sleeve either 3 mm distally or proximally to desired exposure.
3. Rotate knurled knob on driver to line up arrow with "RUN."

Bearing Sleeve Disassembly

1. Rotate knurled knob on driver to line up arrow with "TUBE." Remove bearing sleeve distal end of driver.

BM

Driver Removal for Black Max

1. Driver removal is reversal of installation instructions.

XM

Driver Removal for XMax

1. Move handpiece knurled knob to "SAFE" position.
2. Rotate attachment to left approximately one quarter turn, and remove from distal end of handpiece.

MICROSAWS AND SMALL ATTACHMENTS ASSEMBLY

The microSaws were designed for small bone dissection. The microSaw Drivers provide direct connection to Black Max and XMax. The Drivers also enable rapid exchange of saw head styles through a unique quick-disconnect system.

BM-DRIVER

DRIVER

Keyless Driver Installation

BM

Black Max Keyless Driver Installation

BM-DRIVER Keyless Driver

1. Ensure locking lever is up.
2. Align notch on keyless driver with "RELEASE" arrow on handpiece while inserting drive shaft of Keyless Driver into handpiece. Rotate keyless driver clockwise until notch is aligned with "SECURE" arrow on handpiece. Push locking lever down to locked position.

Disassembly

1. Raise locking lever.
2. Rotate BM-DRIVER counterclockwise and remove from handpiece.

XM

XMax Keyless Driver Installation

DRIVER Keyless Driver

1. Ensure knurled knob on handpiece is in "RUN" or "SECURE" position.
2. Insert drive shaft of keyless driver into handpiece and rotate clockwise until locked. Gently twist back and forth to ensure it is locked into position.

Disassembly

1. Pull knurled knob down and twist counterclockwise until it seats into position.
2. Rotate DRIVER counterclockwise and remove.

BM-DRIVER and DRIVER Duty Cycle

30 Sec ON, 30 Sec OFF for 8 cycles.

The recommendations for times of use for the DRIVER attachments have been determined under average load and worst case ambient air temperature of 85°F (29°C).

Oscillating, Sagittal, and Reciprocating Saw Attachment Assembly

S-SAW	Sagittal microSaw Attachment
R-SAW	Reciprocating microSaw Attachment
O-SAW	Oscillating microSaw Attachment

1. Insert saw attachment drive shaft into distal end of keyless driver. Rotate until three tabs on attachment engage three slots in keyless driver.
2. Continue to rotate counterclockwise while pushing attachment into keyless driver until attachment locks into position and release ring snaps into position. When fully engaged, contours on keyless driver body, release ring, and saw attachment will be in alignment.

Sagittal Saw Blade Assembly

1. Press down on release button to open saw blade mounting plate.
2. Insert saw blade into opening through slot on mounting plate and align saw blade hub with locking pins in mounting plate.
3. Release button and ensure mounting plate is firmly seated on saw blade without gaps.

Reciprocating Saw Blade Installation

1. Rotate chuck counterclockwise until chuck has opened sufficiently to accept a saw blade.
2. If blade has a shank with a shaft, insert shaft of blade in chuck jaws until it is fully inserted and tighten chuck knob clockwise until snug.
3. If blade has a flat shank, insert blade into slots in chuck until it is fully inserted and tighten chuck knob clockwise until snug.

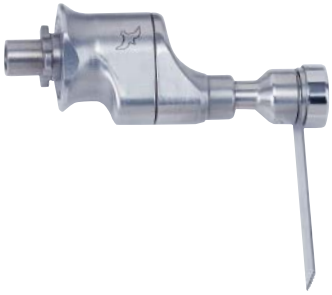
Oscillating Saw Blade Assembly

1. Press down on release button to open saw blade mounting plates.
2. Insert saw blade into opening and align saw blade hub with locking pins in mounting plates. Oscillating saw blades can be aligned in 45° increments.
3. Release button and ensure mounting plates are firmly seated on saw blade without gaps.

S-SAW

R-SAW

O-SAW



Saw Blade Removal

1. Saw blade removal is reverse of installation.

Disassembly
Saw and Small Attachment Removal

1. With one hand supporting attachment, rotate release ring on keyless driver with other hand counterclockwise until attachment is released.

J-Latch and Keyless Jacobs Chuck Attachment Assembly

SA-JACOBS Jacobs Chuck
SA-JLATCH J-latch Chuck

Note: Anspach does not supply dissection tools for SA-JLATCH or SA-JACOBS small attachments.

SA-JLATCH

SA-JACOBS

Keyless driver refers to either BM-DRIVER or DRIVER.

1. Insert attachment drive shaft into distal end of keyless driver. Rotate until three tabs on attachment engage three slots in keyless driver.
2. Continue to rotate counterclockwise while pushing attachment into keyless driver until attachment locks into position and release ring snaps into position.
3. When fully engaged, contours on keyless driver body, release ring, and small attachment will be in alignment.

J-Latch Dissection Tool Assembly

1. Pull back distal sleeve in direction of arrow ▽ on SA-JLATCH attachment and hold it down to insert dissection tool into distal end of attachment.
2. Rotate dissection tool slowly until fully seated.
3. Release distal sleeve and check security of dissection tool by pulling distally on dissection tool.
4. Dissection tool and attachment are secure.

J-Latch Dissection Tool Removal

1. Pull back distal sleeve in the direction of arrow ▽ on SA-JLATCH and hold it down while pulling dissection tool out distally for removal.
2. Release the distal sleeve.

Keyless Jacobs Chuck Dissection Tool Assembly

1. Press down on center ⅄ of release button located on SA-JACOBS attachment while rotating knurled knob on attachment clockwise until fully opened.
2. Insert dissection tool into distal end of attachment until it touches bottom.
3. Rotate knurled knob counterclockwise while centering cutter on attachment until tight; release button.
4. Check security of dissection tool by pulling distally on dissection tool.
5. Dissection tool and attachment are secure.

Caution: Do not press down on release button while attachment is in use.

Keyless Jacobs Chuck Dissection Tool Removal

1. Press down on center ⅄ of release button located on SA-JACOBS attachment while rotating knurled knob on attachment clockwise until fully opened.
2. Pull dissection tool out distally for removal.
3. Release button.

Disassembly
microSaw and Small Attachment Removal

1. With one hand supporting attachment, rotate release ring on keyless driver or e12 handpiece with other hand counterclockwise until attachment is released.

HANDHELD ATTACHMENTS ASSEMBLY

Sagittal Saws

B-SAGITTAL	Black Max Sagittal Saw
MM-SAGITTAL	Sagittal Saw (for XMax)

The B-SAGITTAL and MM-SAGITTAL operate at 120 psi, providing 20,000 cycles per minute while it oscillates through a blade arc of 4 degrees.

BM

Black Max Sagittal Saw Assembly for handpieces with "SECURE" and "RELEASE"

1. The words "SECURE" and "RELEASE" engraved on side of handpiece refer to locking and unlocking attachment on handpiece respectively. Lift lever on handpiece.
2. Align notch on Sagittal Saw with "RELEASE" on handpiece.
3. Turn Sagittal Saw so notch is aligned with "SECURE" on handpiece.
4. Press down lever on handpiece.
5. For B-SAGITTAL, see Blade Assembly.

XM

Sagittal Saw Assembly and Disassembly for handpieces with 🔒 and 🔓.

(Distal end of handpiece or attachment is pointed away from user.)

1. Remove red storage cover. Move handpiece knurled knob to "RUN"🔒 position.
2. Slide Sagittal Saw over distal end of handpiece. Pull Sagittal Saw towards handpiece, and rotate to right approximately one-quarter turn until fully seated. Handpiece knurled knob will move up to seat next to Sagittal Saw.
3. Sagittal Saw is secure.
4. See Blade Assembly.

Disassembly

1. Move handpiece knurled knob to "SAFE" position.
2. Rotate Sagittal Saw to left approximately one-quarter turn, and remove from distal end of handpiece.

Blade Assembly (B-SAGITTAL/MM-SAGITTAL)

1. Raise and fully extend extension handle on saw blade attachment mechanism.
2. Rotate extension handle counter-clockwise to open saw blade mounting plates.
3. Insert saw blade into opening and align saw hub with locking pins in mounting plates. Blades can be aligned in 45 degree increments.
4. Rotate extension handle clockwise to secure saw blade and lower extension handle into closed position.

Perforator Driver

CSR60BM	Perforator Driver with Hudson End (for Black Max)
CSR60	Perforator Driver with Hudson End (for XMax)

This Perforator Driver attachment allows Hudson style cranial perforators to be used with Black Max and XMax Systems (60:1 Ratio, approximately 1,300 rpm.)

Refer to the Cranial Perforator manufacturer's operating instructions for rotational speed requirements.

Note: Instructions are written such that distal end of handpiece and attachment are pointed away from user.

CSR60

Disassembly

1. Move handpiece knurled knob to "RELEASE" position.
2. Rotate Perforator Driver to left approximately one-quarter turn and remove device.
3. Replace red storage cover.

BM

Black Max Perforator Driver Assembly for handpieces with "SECURE" and "RELEASE"

1. Remove red storage cover.
2. Lift lever on handpiece.
3. Slide Perforator Driver over distal end of handpiece until fully seated. Rotate Perforator Driver to right approximately one-quarter turn.
4. Press down lever on handpiece.
5. Pull back retaining sleeve; insert Hudson-end of cranial perforator and release retaining sleeve.

Disassembly

1. Lift lever on handpiece.
2. Rotate Perforator Driver to left approximately one-quarter turn and remove device.
3. Replace red storage cover.

XM

Perforator Driver Assembly for handpieces with 🔒 and 🔓.

1. Remove red storage cover.
2. Move handpiece knurled knob to "RUN" 🔒 position.
3. Slide Perforator Driver over distal end of handpiece. Pull Speed Reducer towards handpiece and rotate to right approximately one-quarter turn until fully seated. Handpiece knurled knob will move up to seat next to Perforator Driver.
4. Pull Perforator Driver retaining sleeve towards handpiece. Insert Hudson-end of cranial perforator and release retaining sleeve.

Disassembly

1. Pull Perforator Driver retaining sleeve towards handpiece and remove cranial perforator from distal end of Perforator Driver.
2. Move handpiece knurled knob to "SAFE" position.
3. Rotate Perforator Driver to left approximately one-quarter turn and remove from distal end of handpiece.
4. Replace red storage cover.

Note: The red storage cap provided with the Perforator Driver is to prevent damage to the shaft.

The cap is removed for cleaning, washing, and sterilization. The cap is used for storage purposes only.

PNEUMATIC HIGH-SPEED SYSTEMS

The following manual cleaning and mechanical/automated cleaning with manual Precleaning instructions have been validated by Anspach for preparing a nonsterile medical device; this instruction is provided in accordance with **ISO 17664:2004 and ANSI/AAMI ST81:2010.**

Warning: Transmissible spongiform encephalopathies (TSE). *DePuy Synthes Power Tools* will not authorize or accept the return of products that directly contact patients or are contaminated with body fluids of a patient who is suspected or confirmed with a TSE/Creutzfeldt-Jakob disease (TSE/CJD) diagnosis. *DePuy Synthes Power Tools* recommends that all Anspach products used on a patient confirmed with a TSE/CJD diagnosis be incinerated. Anspach dissecting tools used on a patient suspected of TSE/CJD diagnosis must be incinerated.

Contact your Sales Representative for replacement of product incinerated under this policy or for temporary equipment while the original equipment is quarantined. Contact the *DePuy Synthes Power Tools* Customer Service department regarding TSE/CJD contamination for additional information.

HIGH-SPEED HANDPIECES

Detergents

- Neutral pH enzymatic detergents are recommended for the manual washing of the high speed handpieces.
- Alkaline detergents with a maximum pH of 11 may be used, but user must demonstrate their effectiveness.
- The process, detergent, and any additives must be discussed with detergent manufacturer.

Warning: Wear eye protection and any additional PPE required.

Caution: Do not immerse! Do not insert brush into handpiece housing. Do not use saline solution for cleaning. Do not use cleaners containing chlorinated phenols of any concentration. Using cleaners/ disinfecting agents containing chlorinated phenols will result in premature hose failure. Do not use hypochlorite (i.e. bleach) solutions, since these will corrode metal components. Do not use alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals which can increase wear and cause device malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device.

1

Preparation

Assemble all necessary supplies such as a lint-free cloth.

Remove the attachment and dissection tool from the handpiece (Figure 1).

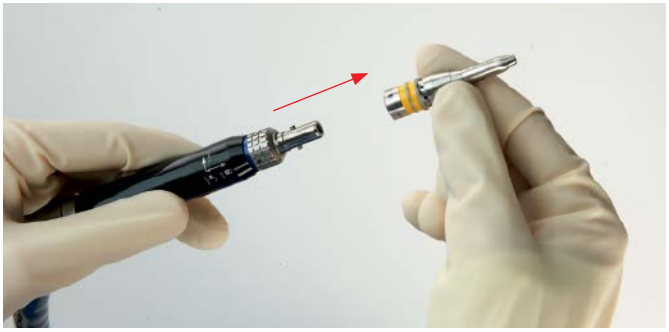


Figure 1

2

Clean

Wipe with a clean, deionized, distilled, or purified water-dampened cloth and mild detergent (neutral pH).

Caution: DO NOT IMMERSE. Handpiece must not be exposed to ingress of water or to severe physical trauma; degradation of unit function and/or performance may occur.

3

Inspect

Visually inspect the handpiece and repeat step 2 until no visible soil remains.

ATTACHMENTS

Caution: Manual cleaning instructions for all attachments except the Minimal Access (MA) attachments and bearing sleeves.

Detergents

- Alkaline detergents with a maximum pH of 11 are recommended for the manual washing of the attachments.
- The process, detergent and any additives must be discussed with detergent manufacturer.

Warning: Wear eye protection and any additional PPE required.

Caution: Do not use alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals which can increase wear and cause device malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device. Do not use ultrasonic equipment or corrosive or harsh chemical soaps. Do not rinse attachment with saline solution.

Note: "DO NOT IMMERSE" as marked on attachments is for OR personnel only.

1

Preparation

Assemble all necessary supplies including Attachment Cleaning Brush (ACB), sponge, lint-free cloth, and soft bristle brush. Remove the attachment and dissection tool from the handpiece (Figure 1).

CSR60 and CSR60-BM only: The red storage cap provided with the Perforator Driver is to prevent damage to the shaft. The cap is removed for cleaning, washing and sterilization (Figure 2). The cap is used for storage purposes only.

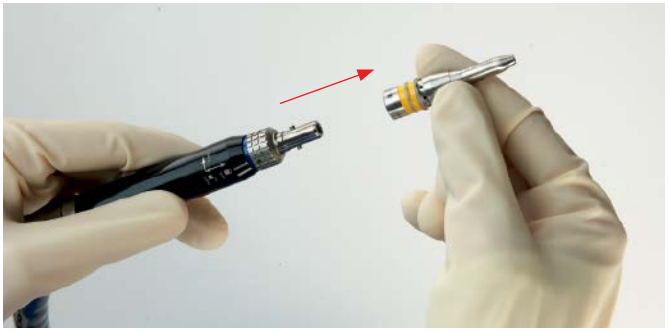


Figure 1

2

Immerse

Fully immerse the attachment in an alkaline cleaner with a maximum pH of 11 (non-chlorinated detergent), prepared as described on the product label, at room temperature, in a suitable container and agitate for 15 seconds (Figure 3).

Figure 2

Figure 3

3

Clean Cannulations

Caution: This step refers ONLY to the following attachments (for other attachments proceed to step 4):

Type of Attachment	Names of Attachments
Straight Attachments	SHORT, MEDIUM, LONG, MIA16, SHORT-HD, MEDIUM-HD, LONG-HD, B-SILVER, B-TURQUOISE, B-VIOLET, B-BLUE-S, B-MRA-S, B-MRA-M, B-MRA-L, B-TURQ-L, B-BLACK, B-RED
Craniotomes	CRANI-A, CRANI-A-R, CRANI-A-01, CRANI-P, CRANI-L, CRANI-L-R, B-TURQ-X, B-GOLD, B-GREEN, B-GREEN-R
Specialty Attachments	ADG, B-GREY-ADG, B-TURQ-CDA, CDA
QD Attachments	QD8, QD8-S, QD11, QD11-S, QD14, QD14-S, B-QD8, B-QD8-S, B-QD11, B-QD11-S, B-QD14, B-QD14-S

Gently insert and remove Anspach Attachment Cleaning Brush (ACB) wetted with alkaline cleaner through either openings (distal or proximal) of the attachment as many times as necessary to remove any foreign debris (Figure 4).

Caution: Do not insert anything into the attachment except the ACB as specified. Do not force the brush into or through the attachment. ACB is to be utilized once per system set and discarded once the system cleaning is complete.

Figure 4

4

Rinse

Rinse the attachment in a suitable container filled with deionized, distilled, or purified water and agitate for 15 seconds.

5

Inspect

Repeat Steps 2–4 until there is no evidence of soils or residuals on the attachment surface or ACB.

Cleaning Instructions for Minimal Access (MA) Attachments

Minimal Access Drivers (MA-D20, MA-20BM, MA-DRIVER)
Minimal Access Bearing Sleeves (MA-10S, MA-10C, MA-15S, MA-15C, MA-15ST, and MA-19ST).

Note: Please refer to cleaning instructions provided with the MA attachments.

FOOT CONTROLS

AutoLube Foot Control

Caution: Do not immerse or sterilize. Do not allow liquid to enter AutoLube, except as specified in the operating manual for adding Anspach oil.

1

Clean

Clean AutoLube foot control by wiping with nonabrasive cloth and disinfectant or mild detergent and water after each case.

2

Add oil

Check oil level and add Anspach oil and filter when level is below "MIN OIL" level line.

3

Store

Store in upright position.

iMRI Foot Control

Caution: DO NOT IMMERSE OR STERILIZE!

1

Clean

Clean iMRI Foot Control by wiping with non-abrasive cloth and disinfectant or mild detergent and deionized, distilled, or purified water after each case.

2

Dry

Dry thoroughly with non-abrasive cloth.

MANUAL PRECLEANING BEFORE MECHANICAL/ AUTOMATED CLEANING

HIGH-SPEED HANDPIECES

Detergents

- A neutral pH enzymatic detergent is recommended.
- Alkaline detergents with a maximum pH of 11 may be used but user must demonstrate their effectiveness.
- The process, detergent, and any additives must be discussed with detergent manufacturer.

Caution:

- **Do not use any alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals which can increase wear and cause device to malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device.**
- **XMax-H may not be cleaned automatically.**

1

Preparation

Assemble all necessary supplies including Attachment Cleaning Brush (ACB), sponge, lint-free cloth, and soft bristle brush. Remove the attachment and dissection tool from the handpiece (Figure 1).

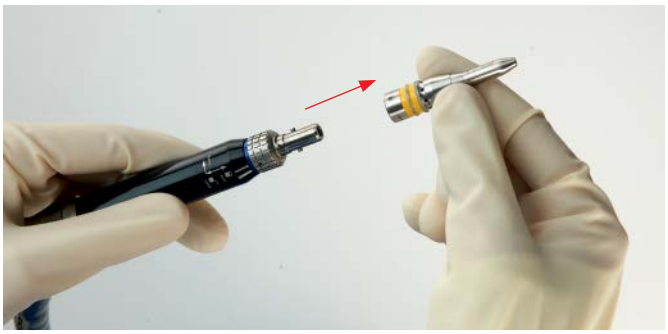


Figure 1

2

Rinse

Rinse the handpiece with distal end pointing down under running cold deionized, distilled, or purified water for a minimum of two (2) minutes. Use a sponge, soft lint-free cloth, or soft bristle brush to assist in removing gross soils (Figures 3 and 4).

Caution: Do not use high pressure water or air. Do not allow running water to enter distal end of handpiece. Do not place the hose end under running water.

Figure 3

Distal End

Figure 4

3

Manipulate Moving Parts

Manipulate the handpiece knurled knob under running cold deionized, distilled, or purified water to loosen or remove gross soil (Figure 5).

Figure 5

4

Clean

Prepare a cleaning solution using neutral pH enzymatic detergent per the manufacturer's directions for correct temperature, water quality (i.e. pH, hardness), and product concentration/dilution.

Spray and wipe the handpiece with the cleaning solution for a minimum of two (2) minutes. Rinse the handpiece thoroughly under running cold deionized, distilled, or purified water for a minimum of two (2) minutes while manipulating the knurled knob (Figures 6 and 7).

Use a sponge, soft lint-free cloth, or soft bristle brush to remove all visible soil.

Place locking mechanism in the "SAFE" position prior to performing the following step (Figure 8).

Hold the handpiece at a downward angle and insert the Anspach Cleaning Brush (ACB) wetted with cleaning solution into the distal end of the handpiece (Figure 9).

Warning: ACB is single use and should only be used to clean one handpiece and associated attachments.

Caution: Do not immerse. Do not allow running water to enter distal end of handpiece. Do not insert ACB beyond last bristle. Do not force ACB into handpiece. Do not place the hose end under running water. Do not use pipe cleaners.

Figure 6

Figure 7

Figure 8

Figure 9

5

Rinse Thoroughly

Rinse the handpiece thoroughly under running hot deionized, distilled, or purified water for a minimum of 2 minutes (Figure 10).

Place locking mechanism in "SAFE" position prior to performing the following step (Figure 11).

Hold the handpiece at a downward angle and flush inside of the distal end using a syringe or pipette filled with hot deionized, distilled, or purified water (Figure 12). Place the knurled knob in the "RUN" position (Figure 11).

Caution: Do not use high pressure water or air. Do not immerse. Do not allow running water to enter distal end of handpiece. Do not place the hose end under running water.

Figure 10

Figure 11

Figure 12

6

Inspect

Visually inspect the handpiece and repeat Steps 2 through 6 until no visible soil remains.

Warning: Manual Precleaning must be followed by mechanical/automated cleaning.

ATTACHMENTS

Detergents

- A neutral pH enzymatic detergent is recommended.
- Alkaline detergents with a maximum pH of 11 may be used but user must demonstrate their effectiveness.
- The process, detergent, and any additives must be discussed with detergent manufacturer.

Caution: Do not use any alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals which can increase wear and cause device to malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device.

Warning: Do not clean the MA-19ST Minimal Access Bearing Sleeve or attachments not mentioned on page 49 in the EM/XM Cleaning and Sterilization Basket.

1

Preparation

Assemble all necessary supplies including Attachment Cleaning Brush (ACB), Small Diameter Cleaning Brush (SDCB), sponge, lint-free cloth, and soft bristle brush. Remove the attachment and dissection tool from the handpiece (Figure 1).

Note: Red storage cap is provided with Perforator Driver to prevent damage to shaft. Cap is removed for cleaning, washing, and sterilization (Figure 2). Cap should be used for nonsterile storage purposes only.

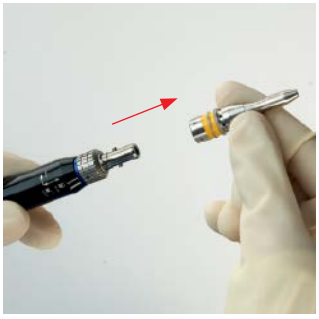


Figure 1

Figure 2

2

Rinse

Rinse the attachment under running cold deionized, distilled or purified water for a minimum of two (2) minutes. Use a sponge, soft lint-free cloth, or soft bristle brush to assist in removing gross soil (Figures 3 and 4).

Caution: Do not use high pressure water or air. Do not rinse attachment with saline solution.

Figure 3

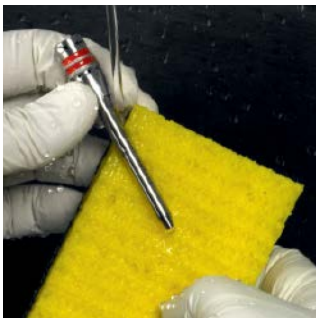


Figure 4

3

Manipulate Moving Parts

Manipulate all moving parts such as release sleeves under running cold deionized, distilled, or purified water to loosen or remove gross soil (Figure 5).

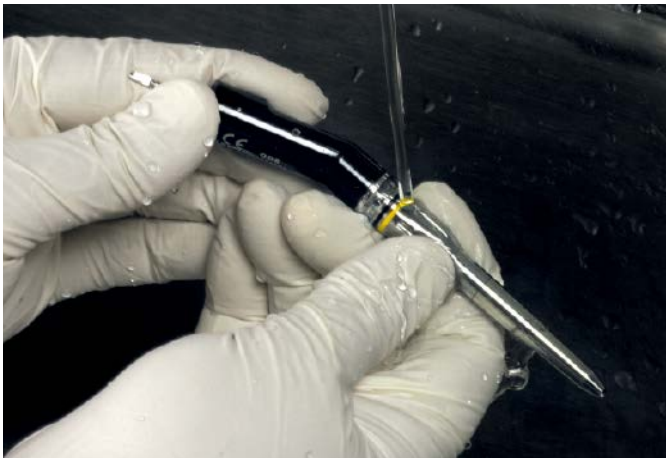


Figure 5

4

Clean

Prepare a cleaning solution using neutral pH enzymatic detergent per the manufacturer's directions for correct temperature, water quality (i.e. pH, hardness), and product concentration/dilution.

Fully immerse the attachment in cleaning solution in a suitable container and manually agitate for 2 minutes (Figure 6). Use a sponge, soft lint-free cloth, or soft bristle brush to remove all visible soil.

Gently use ACB or SDCB wetted in cleaning solution to clean cannulations of attachment. The brushes may be inserted from the distal or proximal end of the attachment (Figure 7).

Warning: ACB and SDCB are single use and should only be used to clean one set of attachments.

Caution: Do not force ACB or SDCB into or through attachment. Do not use ACB or SDCB to clean the MA-D20, MA-D20BM and MA-DRIVER. For Minimal Access Attachment Bearing Sleeves, use SDCB only. Do not use pipe cleaners.

Note: "DO NOT IMMERSE" as marked on the attachment is for Operating Room personnel only. The SDCB may be inserted from the distal or proximal end of the bearing sleeve.

Figure 6

Figure 7

5

Rinse thoroughly

Rinse the attachment thoroughly under running hot deionized, distilled, or purified water for a minimum of two (2) minutes (Figure 8). Use a syringe or pipette filled with hot deionized, distilled, or purified water to flush lumens or channels (Figure 9).

Caution: Do not use high pressure water or air. Do not rinse attachment with saline solution.

Figure 8

Figure 9

6

Inspect

Visually inspect the attachment and repeat Steps 2 through 6 until no visible soil remains.

Warning: Manual Precleaning must be followed by mechanical/automated cleaning.

MECHANICAL/AUTOMATED CLEANING FOLLOWING MANUAL PRECLEANING

HIGH-SPEED HANDPIECES AND ATTACHMENTS

Detergents

- A neutral pH enzymatic detergent is recommended.
- Alkaline detergents with a maximum pH of 11 may be used but user must demonstrate their effectiveness.
- The process, detergent and any additives must be discussed with detergent manufacturer.

Caution: Do not use any alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals which can increase wear and cause device to malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device. Bearings and seals of all devices are exposed to greater stress during mechanical/automated cleaning than manual cleaning. If devices are mechanically cleaned they must be sent to a *DePuy Synthes Power Tools* Service Center at least once a year for maintenance.

Warning: Do not clean the MA-19ST Minimal Access Bearing Sleeve in the EM/XM Cleaning and Sterilization Basket.

Mechanical/Automated Cleaning Guidelines

DePuy Synthes Power Tools can only be mechanically cleaned under the following conditions:

- Cannulations must be pre-cleaned with appropriate brushes as described in Precleaning instructions.
- Devices must not be cleaned using ultrasonic equipment.
- Handpieces must not be immersed in cleaning solution but may be sprayed with it.
- Fully deionized or purified water must be used during final rinse to prevent corrosion and spots.
- Devices must be cleaned immediately after use to ensure blood and tissue never dry on them.
- National regulations must be observed.
- You must follow standard hospital procedures.
- You must follow manufacturer's recommendations for any detergents, disinfectants, and washing equipment used.

1

Loading the Basket

Load the devices in the basket by securing them in the appropriate brackets as marked on the basket (Figure 1). Reference loading configuration pictures on page 49 for proper placement and positioning of devices. Where applicable, distal end of devices should be angled downward.

Warning: Red protective cap for Perforator Driver must be left off during mechanical/automated cleaning (Figure 2).

Caution: Connector ends of electric and pneumatic handpieces must be sealed with special seal caps provided (Figure 3).

Note: Before putting on seal cap, turn black cap to wrap cable tight around it (Figure 4).

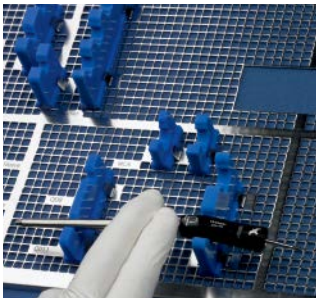


Figure 1

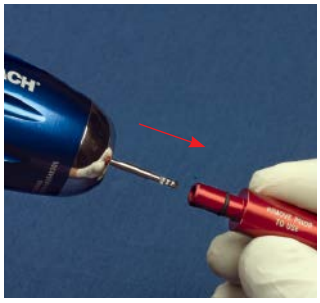


Figure 2

Figure 3

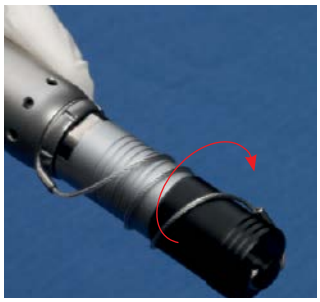


Figure 4

2

Mechanical/Automated Cleaning Cycle Process Parameters

Cycle	Duration (minimum)	Cleaning Instructions
Rinse	2 minutes	Cold deionized or purified water
Pre-wash	1 minute	Warm deionized or purified water (≥ 40°C); use detergent
Cleaning	2 minutes	Warm deionized or purified water (≥ 45°C); use detergent
Rinse	5 minutes	Rinse with deionized or purified water
Thermal Processing	5 minutes	Hot deionized water, ≥ 93°C
Dry	40 minutes	≥ 90°C

Caution: Do not use neutralizing agent.

3

Inspect

Visually inspect the devices and repeat the manual pre-clean and mechanical/automated clean if visible soil remains.

Remove seal cap from connector end of handpiece and drain until no visible droplets are coming from the handpiece or connector.

INSPECTION AND MAINTENANCE

Perform these activities regularly as per institution policy.

Warning: Do not use any damaged equipment. Return to *DePuy Synthes Power Tools* repair facility.

Attachments

Straight Attachments

- B-SILVER
- B-TURQUOISE
- B-VIOLET
- B-BLUE-S
- B-MRA-S
- B-MRA-M
- B-MRA-L
- B-TURQ-L
- B-BLACK
- B-RED
- LONG
- LONG-S
- LONG-01
- LONG-HD
- MEDIUM
- MEDIUM-HD
- MIA16
- SHORT
- SHORT-HD
- XL-HD

Visually inspect for any damage to the tube.

Short

Angle Attachments

- B-QD8
- B-QD8-S
- B-QD11
- B-QD11-S
- B-QD14
- B-QD14-S
- MA-D20
- MA-D20BM
- MA-DRIVER
- QD8
- QD8-S
- QD11
- QD11-S
- QD14
- QD14-S

Visually inspect for bent or broken drive shaft. and for any damage to the tube

QD8

Craniotomes

- B-TURQ-X
- B-GOLD
- B-GREEN
- B-GREEN-R
- CRANI-A
- CRANI-A-R
- CRANI-L
- CRANI-L-R
- CRANI-P

Visually inspect for bent or broken foot.

CRANI-A

Other Attachments

- ADG
- B-GREY-ADG
- B-TURQ-CDA
- B-ORANGE-90
- B-ORANGE-45
- BM-DRIVER
- CSR60BM
- CDA
- CSR60
- DRIVER
- MDA
- ORANGE-45
- ORANGE-90
- O-SAW
- R-SAW
- S-SAW
- SA-JACOBS
- SA-JLATCH

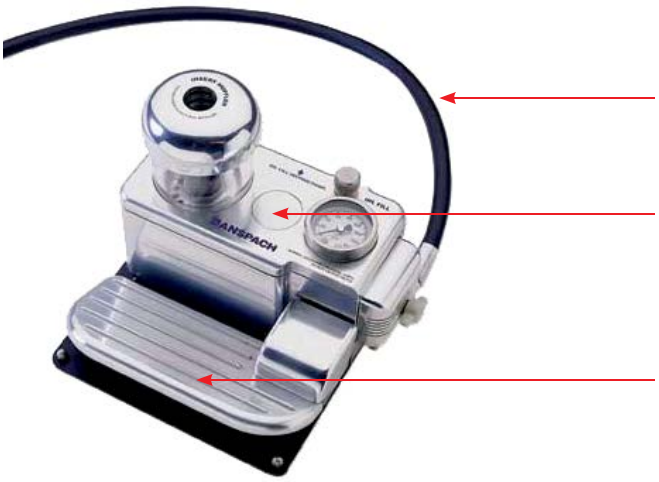
Visually inspect for overall damage or missing components.

CSR60

Foot Controls

- All AutoLube Models

Visually inspect for damage to the hose.
Visually inspect for damage to the housing or pedal.



Handpiece

- XMax
- XMax-H
- BLACKMAX-N
- BLACKMAX-N-LP

Ensure that the knurl knob operates properly.

- If the knob is hard to turn, it may be lubricated. Please refer to the instructions for use.

Visually inspect for damage to the silicone hose.

Connect to foot control and operate. The handpiece should operate smoothly.

- There is no requirement to operate with attachment or dissection tool.

LUBRICATION

HANDPIECES

Do not lubricate handpieces.

ATTACHMENTS

Caution: This step is for attachments only.

1

Immerse in Lubricant

After cleaning and rinsing, fully immerse the attachment in instrument milk (non-silicone based medical lubricant) prepared as described on the product label, at room temperature, in a suitable container and agitate for 15 seconds (Figure 2).

Figure 2

2

Drain

Remove the attachment and allow it to drain until no visible droplets are coming from it.

Caution: Do not rinse out instrument milk. Do not apply mineral oil or other lubricants, which may cause the attachment to overheat.

HIGH-SPEED HANDPIECES AND ATTACHMENTS

The following sterilization instruction has been validated by Anspach in accordance with ISO 17665.

Before sterilizing: Ensure sterilization equipment is in proper working order as specified by manufacturer. Ensure equipment manufacturer's instructions are properly employed by trained and qualified personnel. Ensure actual cycle employed has been properly validated for the device(s)/load configuration being processed and appropriate sterilization indicator devices are included for each process and cycle.

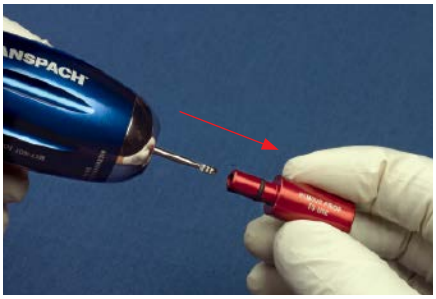


Figure 1

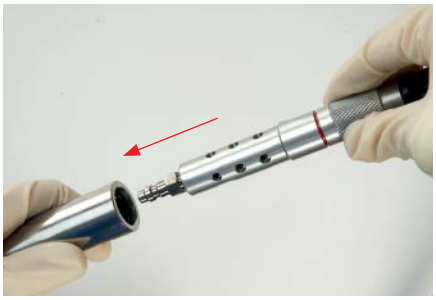


Figure 2

Caution

- **Red protective cap for CSR60 and CSR60-BM must be removed prior to sterilization (Figure 1). In the case mechanical/automated cleaning was done in the EX-BSKT, seals cap from connector end of pneumatic handpiece must be removed prior to sterilization (Figure 2).**
- **Devices must be cleaned prior to sterilization using the validated cleaning method outlined in these instructions.**

Preparation

Following cleaning and lubrication, load the basket and sterilize in accordance with the following guidelines.

Load attachments and handpiece in EM/XM Cleaning and Sterilization Basket by securing them in appropriate brackets as marked on basket with distal end angled down.

Replace seal cap in its bracket and lay handpiece connector in bottom of basket.

Secure the lid on the basket.

Package for Sterilization

When wrapping the basket the lid must be used.

Double wrap basket or instruments in accordance with local procedures, using standard wrap or wrapping techniques such as those described in ANSI/AAMI ST79.

Warnings

- **You must follow manufacturer's instructions for any wraps used.**
- **Do not use any other sterilization method or cycle than those listed below which have been validated in accordance with ISO 17665.**

If using the EMAX2-TRAY or XM-CASE or BM-CASE-TRAY:

Method/Cycle	Exposure Temperature	Exposure Time	Minimum Dry Time
Steam Autoclave/Pre-vacuum (wrapped or unwrapped)	Option 1: 132°C	4 minutes	30 minutes
	Option 2: 134°C–138°C	3–18 minutes	30 minutes
Steam Autoclave/Gravity Air Displacement (wrapped or unwrapped)	Option 1: 132°C	15 minutes	30 minutes
	Option 2: 132°C–138°C	15–18 minutes	30 minutes

Warning: STERRAD®—refer to the accompanying documentation of the individual products to determine compatibility.

If using the EX-BSKT Washing and Sterilization Basket:

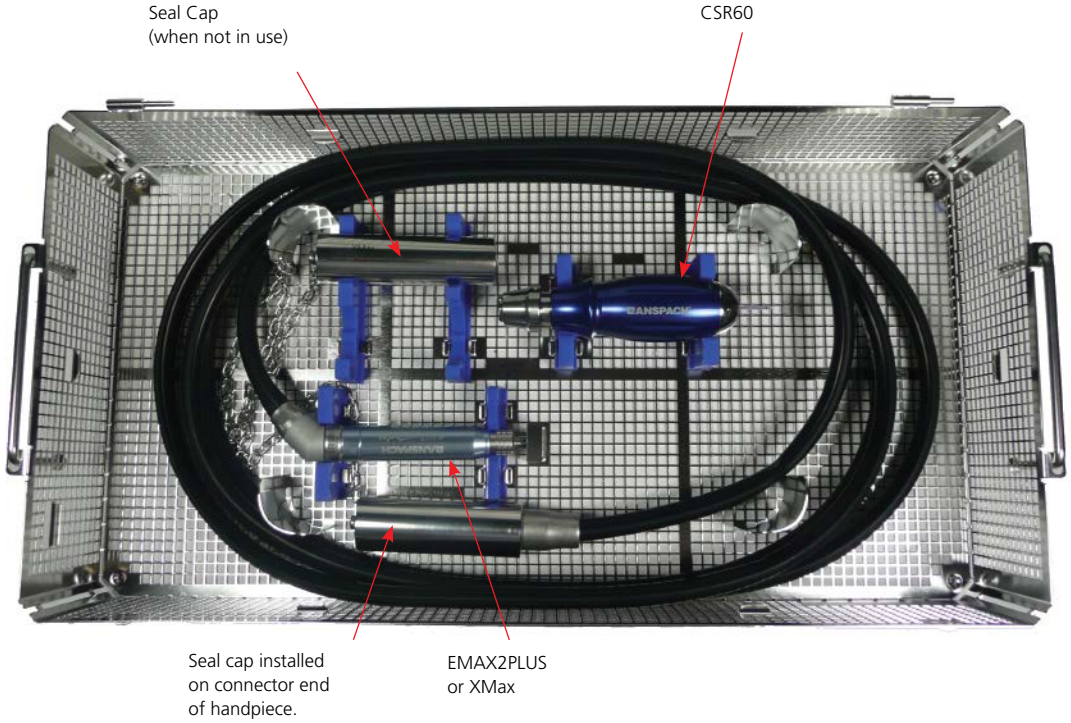
Method/Cycle	Exposure Temperature	Exposure Time	Minimum Dry Time
Steam Autoclave/Pre-vacuum (wrapped or unwrapped)	Option 1: 132°C	4 minutes	20 minutes
	Option 2: 134°C–138°C	3–18 minutes	20 minutes
Steam Autoclave/Gravity Air Displacement (wrapped or unwrapped)	Option 1: 132°C	15 minutes	15 minutes
	Option 2: 132°C–138°C	15–18 minutes	15 minutes

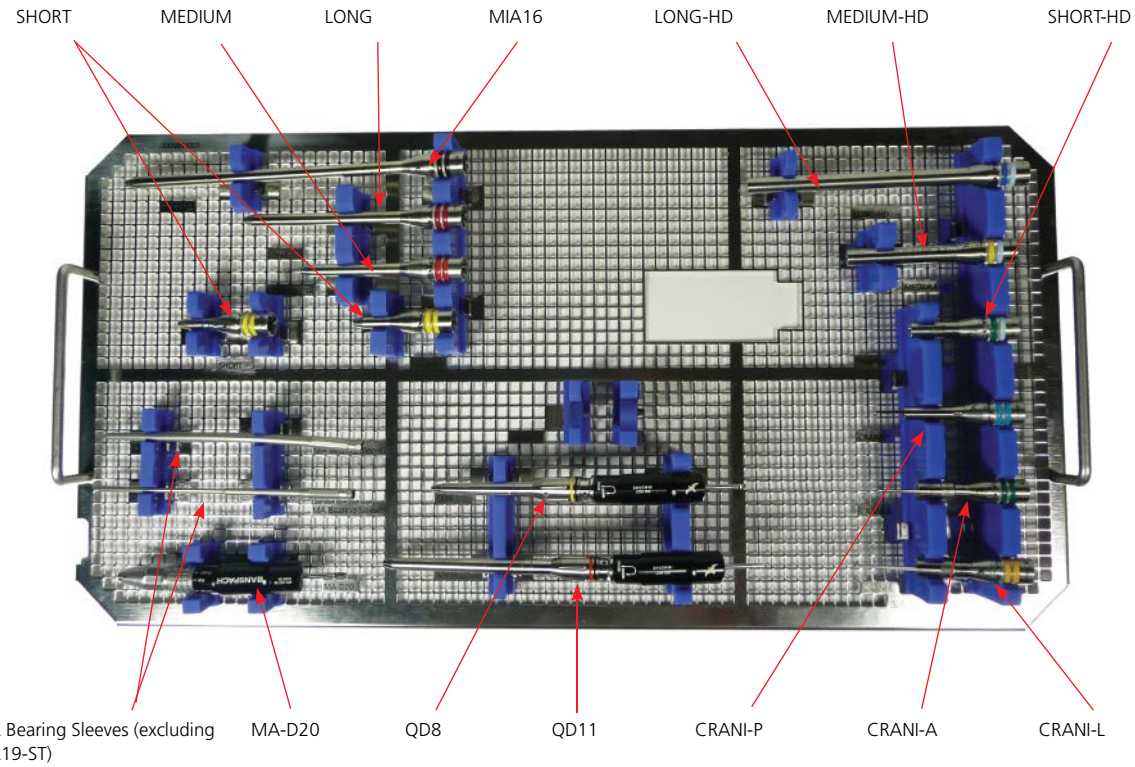
Notes

- **Foot Controls, consoles and irrigation pumps should not be sterilized.**
- **It is required to include the drying cycle to avoid possible adverse effects caused by exposure to residual moisture.**
- **Metal devices, tools and equipment are constructed of materials unaffected by normal environmental conditions of current standard sterilization means, when proper operational techniques are employed.**
- **Effectiveness of sterilization equipment or sterilization processes are directly dependent upon numerous factors beyond *DePuy Synthes Power Tools*' control including among other things; sterilization means, processes and wrapping techniques employed, brand, model and condition of sterilization equipment, care and maintenance techniques employed and operator knowledge and experience.**
- ***DePuy Synthes Power Tools* cannot anticipate all possible equipment, processes and/or conditions that may be encountered. The suggested operation conditions are to be considered as a starting point for determination of the overall process capability, without regard for type or condition of equipment used or methods, techniques or practices employed by user. Use of proper sterilization indicator devices is strongly recommended. It is recommended that a drying cycle be included to avoid possible adverse effects caused by exposure to condensation.**

LOADING CONFIGURATION

HIGH-SPEED HANDPIECES AND ATTACHMENTS





PNEUMATIC HANDPIECES (BLACK MAX AND XMAX)

Problem	Possible Cause	Solution
Lack of power or excessive handpiece noise	• Inadequate lubrication	• Add OIL-II to AutoLube.
	• Inadequate operating pressure	• Check pressure on AutoLube. Extra long extension hose from air source could reduce operating pressure.
		• Check Schrader connection.
		• Check for handpiece hose occlusion.
	• Muffler not connected properly	• Check connection between muffler and AutoLube Muffler must be inserted past red line.
	• Handpiece hose damaged	• Return to *DePuy Synthes Power Tools* for service.
	• Faulty internal component	• Return to *DePuy Synthes Power Tools* for service.
	• Pressure Relief Valve activated	• Check for handpiece occlusion, remove the source of the occlusion. Return to *DePuy Synthes Power Tools* for service.
Handpiece does not rotate when foot pedal is activated	• Handpiece stalling	• Rotate dissection tool, then activate foot pedal.
	• Faulty attachment	• Clean or replace attachment.
	• Handpiece lock engaged	• Unlock handpiece.
	• Faulty internal component	• Return to *DePuy Synthes Power Tools* for service.
Handpiece vibration or extremely hot	• Inadequate lubrication	• Add Anspach oil to AutoLube.
	• Handpiece out of balance	• Return to *DePuy Synthes Power Tools* for service.
Excessive vibration of dissection tool	• Dissection tool may be bent	• Replace with new dissection tool.
	• Dissection tool may not be fully seated	• Reassemble dissection tool and attachment.
	• Improper attachment and dissection tool combination	• Only use correct dissection tool with appropriate attachment.
	• Possible attachment bearing damage	• Return attachment to *DePuy Synthes Power Tools* for service.
Black Max Lever will not lower	• Dissection tool not seated properly	• Reassemble dissection tool and attachment.
	• Debris built up inside handpiece	• Remove attachment, lift lever, and tap distal tip of handpiece against hard surface until debris is dislodged.
	• Broken dissection tool in handpiece	• Lift lever, tap distal tip of handpiece against hard surface until dissection tool is dislodged.
XMax knurled knob will not secure	• Dissection tool not seated properly	• Reassemble dissection tool and attachment.
	• Debris built up inside handpiece	• Remove attachment and tap distal tip of handpiece against hard surface until debris is dislodged.
	• Broken dissection tool in handpiece	• Remove attachment and tap handpiece against hard surface until dissection tool is dislodged.
Attachment is hot	• Debris lodged inside attachment	• Clean attachment using Anspach attachment cleaning instructions located in this manual.
	• Possible bearing damage	• Return attachment to *DePuy Synthes Power Tools* for service.
Craniotome attachment is bent	• Excessive force used in operation	• Do not use, replace attachment.
Inoperative foot control	• Oil leaking out of AutoLube	• Replace AutoLube filter, check oil level. Do not overfill AutoLube.
	• Faulty air connection	• Check connection at air source.
	• AutoLube was sterilized or submerged in fluids	• Return to *DePuy Synthes Power Tools* for service.
	• Water in the AutoLube	• Return to *DePuy Synthes Power Tools* for service.

ORDERING INFORMATION

XM

XMax Attachments

SHORT	5 cm Short Attachment
MEDIUM	8 cm Medium Attachment
LONG	11 cm Long Attachment
LONG-S	10.5 cm Long Attachment
LONG-01	10.5 cm Long Attachment, Non-tapered End
MIA16	16 cm Minimally Invasive Attachment
SHORT-HD	5 cm Heavy Duty Short Attachment
MEDIUM-HD	8 cm Heavy Duty Medium Attachment
LONG-HD	12.4 cm Heavy Duty Long Attachment
XL-HD	20.2 cm Heavy Duty Extra Long Attachment
ADG	7.2 cm Adjustable Drill Guide
CDA	6.8 cm Controlled Depth Attachment
CRANI-A	6.5 cm Adult Craniotome
CRANI-A-01	6.5 cm Adult Craniotome, Thin
CRANI-P	6.5 cm Pediatric Craniotome
CRANI-L	7.5 cm Large Craniotome
CRANI-A-R	6.5 cm Rotating Adult Craniotome
CRANI-L-R	7.5 cm Large Rotating Craniotome
MA-DRIVER	Straight Driver
MA-D20	20° Angle Driver
MA-15S	Bearing Sleeve, 15 cm Straight
MA-15C	Bearing Sleeve, 15 cm Curved
MA-15ST	Bearing Sleeve, 15 cm Straight Taper
MA-19ST	Bearing Sleeve, 19 cm Straight Taper
MA-10S	Bearing Sleeve, 10 cm Straight
MA-10C	Bearing Sleeve, 10 cm Curved
ORANGE-45	45° Contra Angle Attachment
ORANGE-90	90° Right Angle Attachment
QD8	8 cm Quick Disconnect Angle Attachment
QD8-S	7.5 cm Quick Disconnect Angle Attachment
QD11	11 cm Quick Disconnect Angle Attachment
QD11-S	10.5 cm Quick Disconnect Angle Attachment
QD14	14 cm Quick Disconnect Angle Attachment
QD14-S	13.5 cm Quick Disconnect Angle Attachment
CSR60	Perforator Driver with Hudson End
DRIVER	Keyless Driver
MM-SAGITTAL	Sagittal Saw
O-SAW	Oscillating microSaw Attachment
R-SAW	Reciprocating microSaw Attachment
S-SAW	Sagittal microSaw Attachment
SA-JACOBS	Small Attachment, Jacobs Chuck
SA-JLATCH	Small Attachment, J-Latch

Black Max Attachments

B-SILVER	6.1 cm Attachment
B-TURQUOISE	5.9 cm Attachment
B-VIOLET	8.2 cm Attachment
B-BLUE-S	11.25 cm Attachment
B-TURQ-L	12.6 cm Attachment
B-GREY-MIA16	16 cm MIA
B-BLACK	19 cm Attachment
B-RED	26.65 cm Attachment
B-MRA-S	9.4 cm Revision Attachment
B-MRA-M	16.5 cm Revision Attachment
B-MRA-L	22 cm Revision Attachment
B-ORANGE-45	Contra Angle Attachment (Multiple Angle)
B-ORANGE-90	Right Angle Attachment (90°)
B-GREY-ADG	8.7 cm Adjustable Drill Guide Attachment
B-TURQ-CDA	Controlled Depth Attachment
B-GOLD	Large Craniotome
B-GOLD-R	Rotating Large Craniotome
B-GREEN	Standard Craniotome
B-GREEN-R	Rotating Green Craniotome
B-TURQ-X	Pediatric Craniotome
B-QD8	8 cm Angle Attachment
B-QD8-S	7.5 cm Angle Attachment
B-QD11	11 cm Angle Attachment
B-QD11-S	10.5 cm Angle Attachment
B-QD14	14 cm Angle Attachment
B-QD14-S	13.5 cm Angle Attachment
MA-D20BM	20° Angle Driver
MA-15S	Bearing Sleeve, 15 cm Straight
MA-15C	Bearing Sleeve, 15 cm Curved
MA-10S	Bearing Sleeve, 10 cm Straight
MA-10C	Bearing Sleeve, 10 cm Curved
MA-15ST	Bearing Sleeve, 15 cm Straight Taper
MA-19ST	Bearing Sleeve, 19 cm Straight Taper
B-SAGITTAL	Black Max Sagittal Saw
BM-DRIVER	Keyless Driver
O-SAW	Oscillating microSaw Attachment
R-SAW	Reciprocating microSaw Attachment
S-SAW	Sagittal microSaw Attachment
CSR60BM	Perforator Driver with Hudson End
SA-JACOBS	Small Attachment, Jacobs Chuck
SA-JLATCH	Small Attachment, J-Latch

iMRI

IMRI Instrument System

IMRI-MOTOR	iMRI Handpiece
IMRI-FOOT-CTRL	iMRI Air Control
IMRI-SHORT	iMRI Short Attachment
IMRI-SHORT-HD	iMRI Short HD Attachment
IMRI-CRANI-A	iMRI Crani-A Attachment
IMRI-S-4B	4 mm Fluted Ball
IMRI-S-1004TD	1 mm x 4 mm Twist Drill w/Stop
IMRI-S-1R	1.4 mm x 12.8 mm Fluted Router
IMRI-A-CRN	1.85 mm x 16 mm Fluted Router
IMRI-SHD-6B	6 mm Fluted Ball
IMRI-S-8NS-M	3 mm Fluted Matchstick, extends 8.9 mm less
IMRI-OIL	iMRI Synthetic Oil

Irrigation System

IRRIGATE-TUBE	Sterile Tubing and Hoseclips
IRRIGATE-TUBE-HF	High Flow Sterile Tubing and Hoseclips
IRR-CLIP-10	Irrigation Clip for SHORT
IRR-CLIP-20	Irrigation Clip for QD8, QD8-S, B-QD8
IRR-CLIP-30	Irrigation Clip for SHORT-HD, B-SILVER
IRR-CLIP-40	Irrigation Clip for MEDIUM-HD, LONG-HD, B-BLUE-S, B-VIOLET
IRR-CLIP-50	Irrigation Clip for MEDIUM, LONG, LONG-S, B-TURQ-L
IRR-CLIP-60	Irrigation Clip for QD11, QD11-S, QD14, QD14-S, B-QD11, B-QD11-S, B-QD14, B-QD14-S

BM **XM**

Pneumatic Handpieces

BLACKMAX-N	Swivel/Angle Handpiece
BLACKMAX-N-LP	Low Pressure Swivel/Angle Handpiece
XMax	XMax Handpiece

BM **XM**

Pneumatic Accessories

ACB	Attachment Cleaning Brush
SDCB	Small Diameter Cleaning Brush
AL-III-IRR-MA7	Foot Control for Irrigation System, MA7 Adapter
AUTOLUBE-III	Foot Control
AUTOLUBE-III-DISS	Foot Control, DISS Adapter
AL-III-DISS-20	Foot Control with 20' Hose, DISS Adapter
AUTOLUBE-III-FG	Foot Control with Foot Guard
AUTOLUBE-III-FG7	Foot Control with Foot Guard, MA7 Adapter
AUTOLUBE-III-IRR	Foot Control for Irrigation System
AUTOLUBE-III-MA7	Foot Control, MA7 Adapter
AUTOLUBE-III-NK	AutoLube/Foot Control with Nitrogen Keyed Adapter
AUTOLUBE-III-20	Foot Control with 20' Hose
AL-III-30	Foot Control with 30' Hose
AL-III-DISS-30	Foot Control with 30' Hose, DISS Adapter
FILTER-II	AutoLube II and III Filters (5/pkg.)
OIL-II	Instrument Oil w/1 Replacement Filter for AutoLube -II and -III
HOSE	20-Foot Air Extension Hose
HOSE-5	5-Foot Air Extension Hose
HOSE-10	10-Foot air Extension Hose
HOSE-10-DISS	10-Foot Air Extension Hose with DISS Adapter
HOSE-15-DISS	15-Foot Air Extension Hose with DISS Adapter
HOSE-20-DISS	20-Foot Air Extension Hose with DISS Adapter
HOSE-DISS	10-Inch Air Extension Hose with DISS Adapter
B-CASE-TRAY	Sterilization Case with Tray
MM-CTR-RACK	Cutting Burr Rack
XM-CASE	Sterilization Case with Tray
PG	Pistol Grip for Black Max
SCHRADER-F	SCHRADER Adapter, Female

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J11813-B 11/13 19-0021A